
APPENDIX

APPENDIX A. PROJECTIONS OF NAVY ENLISTED RETENTION AND RECRUITING

Enlisted Retention

To estimate the future size of the Navy's career force, CBO uses an inventory flow model to simulate the movement of personnel with over four years of active service. This model multiplies the actual number of people in each year of service at the end of fiscal year 1982 by a "continuation rate"--which measures the percentage of enlisted personnel who began the year on active duty and will remain during the following year. (The model also determines the recruit demand for a given year by adding losses to any increase in total strength from one year to the next.) The successive application of continuation rates to the projected numbers of people in each year of service generates a multiyear projection of the career force size.

The inventory model uses a set of parameters that fix the total enlisted end strength, numbers of recruits with previous military service who will be accepted, the distribution of recruits by length of initial enlistment, and rates of attrition that indicate how many recruits will fail to complete the first year of service. Table A-1 shows the values of these parameters that were used to make the projections of Navy career force size.

Reenlistment Rates

The most important variable determining the size of future career forces is the reenlistment rate. (Reenlistment rates are a subset of continuation rates and measure the proportion of persons who are eligible to separate and who choose to remain on active duty for two or more years.) Since continuation rates measure the flows of all personnel--including those not facing a reenlistment decision--reenlistment rates are more useful for analyzing the effects of changes in pay and civilian unemployment conditions. CBO adjusted the actual 1982 Navy reenlistment rates to reflect the projected patterns of military pay and unemployment in future years. These adjustments were made using CBO's estimates of pay and unemployment elasticities (see Table A-2). The formula used to make the reenlistment rate adjustments is:

TABLE A-1. CBO'S ASSUMPTIONS ABOUT FUTURE NAVY ENLISTED FORCES: END STRENGTH, ATTRITION, AND NUMBER OF RECRUITS WITH PREVIOUS MILITARY EXPERIENCE AND LENGTH OF INITIAL ENLISTMENT

	1984	1985	1986	1987	1988
Active End Strength <u>a/</u> (in thousands)	509.7	521.8	531.6	537.3	542.4
Rate of Recruit Attrition (in percent)	9.3	9.3	9.3	9.3	9.3
Number of Prior Service Recruits (in thousands)	12.8	12.8	12.8	12.8	12.8
Distribution of Initial Enlistment Lengths (in percent)					
3 years	15.0	15.0	15.0	15.0	15.0
4 years	67.0	67.0	67.0	67.0	67.0
5 years	5.0	5.0	5.0	5.0	5.0
6 years	13.0	13.0	13.0	13.0	13.0

a. These figures include full-time reserve personnel (TARS).

$$\Delta r_{it} = \epsilon x \frac{P_{it} - P_{io}}{P_{io}} \times r_{io}$$

where Δr_{it} = estimated change in the reenlistment rate for year of service i at time t

r_{io} = reenlistment rate for year of service i in base year (1982)

P_{it} = regular military compensation (RMC) in year of service i at time t

TABLE A-2. CBO PAY AND UNEMPLOYMENT ELASTICITIES USED FOR NAVY CAREER FORCE PROJECTIONS

Year of Service	Pay Elasticity	Unemployment Elasticity
1-2 <u>a/</u>	--	--
3	1.6	1.0
4	3.3	0.5
5	1.9	0.2
6	1.2	0.2
7	1.4	0.2
8	1.2	0.5
9	1.2	0.4
10	1.0	0.2
11	0.5	0.1
12	0.3	0.1
13	0.4	0.1
14	0.2	0.1
15	0.2	0.1
16	0.0	0.1
17	0.0	0.1
18	0.0	0.1
19	0.8	0.2
20	1.0	0.3
21	0.9	0.0
22-30 <u>a/</u>	--	--

- a. Elasticity not calculated. Enlisted retention in these years is assumed to be controlled by Navy policies regarding attrition and promotion, rather than pay or unemployment.

P_{i0} = regular military compensation (RMC) in base year 1982

ϵ = pay elasticity.

Adjustments for unemployment rate changes were made using the same technique with unemployment rate variables substituted for pay variables. Table A-3 shows the 1982 base reenlistment rates and the projected rates for the economic assumptions discussed in Chapter III.

TABLE A-3. CBO REENLISTMENT RATE PROJECTIONS FOR NAVY ENLISTED PERSONNEL (In percent)

Year of Service	Actual 1982	Projections					
		1983	1984	1985	1986	1987	1988
3	37.3	40.7	34.6	32.3	30.6	29.0	27.8
4	38.3	38.8	36.0	34.7	33.7	33.0	32.2
5	43.4	43.3	41.9	41.4	41.0	40.5	40.3
6 <u>a/</u>	36.9	36.4	36.4	36.4	36.4	36.4	36.4
7	62.4	62.7	60.9	60.0	59.5	58.8	58.3
8	69.4	72.1	66.9	64.6	63.0	61.2	59.8
9	75.3	77.5	72.9	70.8	69.3	68.1	66.9
10	77.8	78.5	76.2	75.2	74.5	73.6	73.0
11	81.3	81.6	80.5	79.9	79.5	79.1	78.8
12	85.7	86.3	85.1	84.3	84.0	83.6	83.3
13	91.7	91.2	91.2	91.2	91.2	91.2	91.2
14	94.3	95.0	93.7	93.1	92.6	92.2	91.7
15	95.6	96.5	94.9	94.3	93.9	93.4	93.0
16	96.1	96.1	96.1	96.1	96.1	96.1	96.1
17	97.0	97.0	97.0	97.0	97.0	97.0	97.0
18	96.9	96.9	96.9	96.9	96.9	96.9	96.9
19 <u>b/</u>	77.6	78.6	76.2	75.2	74.3	73.6	73.0
20	38.5	39.3	37.4	36.8	36.1	35.7	35.1
21 <u>c/</u>	45.4						
22	50.0						
23	55.6						
24	60.5						
25	66.2						
26	65.3						
27	60.4						
28	83.6						
29	66.7						
30 or more	38.1						

- a. Year of service 6 reenlistment rates were set to constant value of 36.4 percent in 1984 to 1988. Most losses in this year of service are six-year enlistees who have previously chosen not to extend for additional service. Thus, their decisions are generally not influenced by pay and unemployment conditions at this point.
- b. Projections include retirees with early discharge credit.
- c. Years 21-30 not projected since "up or out" promotion and other force management policies are in effect.

Enlisted Recruiting

To project recruiting results for the Navy, CBO first estimated the total demand for recruits and divided this total between men and women according to the Navy's plans for 1984. The demand for men was further divided into demands for non-prior-service recruits and prior-service recruits. Second, the future supply of "scarce" recruits--male high school graduates with no previous service who score in categories I to III--was estimated using 1982 recruiting results adjusted for four variables: military pay, the youth unemployment rate, numbers of Navy recruiters, and the size of the youth population. Third, the number of other high school graduates with test scores in category IV--the lowest acceptable category--was projected. Because these recruits are generally available in large numbers, their numbers are determined by demand rather than supply.

Requirements for Enlisted Men and Women

Although the Navy plans to increase the number of women in the enlisted force from 37,000 in 1982 to 45,000 in 1985, no increase in female non-prior-service accessions is planned over the next several years. CBO assumed that the following numbers of enlisted men and women will be recruited in 1984 through 1988:

<u>Type of Personnel</u>	1984	1985	1986	1987	1988
			(in thousands)		
Non-Prior-Service	85.3	88.0	88.2	86.9	86.8
Male	75.3	78.0	78.2	76.9	76.8
Female	10.0	10.0	10.0	10.0	10.0
Prior Service (male and female)	12.8	12.8	12.8	12.8	12.8
Total Recruits	98.1	100.8	101.0	99.7	99.6

Supply of Male High School Graduates, Categories I-III

The supply of "scarce" recruits to the Navy was projected using four variables: the relative level of pay, rate of youth unemployment, the number of recruiters, and the size of the youth population. The relationship between each variable and the supply of recruits is measured by an

elasticity. CBO used the results of previous studies to select a set of elasticities on which to base the projections (see Table A-4). 1/

TABLE A-4. ASSUMED ELASTICITIES OF RECRUIT SUPPLY FOR CHANGES IN FOUR KEY VARIABLES (By service and AFQT category)

AFQT Category	Military/Civilian Pay	Rate of Youth Unemployment	Number of Military Recruiters	Size of Youth Population
I-III A	1.20	0.50	0.55	0.45
III B	0.90	0.30	0.45	0.55

CBO's projections of the supply of scarce male recruits used the military pay and unemployment rate assumptions discussed in Chapter III. The number of recruiters was assumed to be constant at 1982 levels and the estimated number of 17- to 25-year-old males declined from 1.84 million in 1984 to 1.70 in 1988.

Supply of Other High School Graduates

The number of other high school graduates--who score in category IV on the entrance exam--was assumed to be no greater than the recent Navy recruiting results. The projections assume this rate to be 12 percent of the total male recruits.

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1. For a further discussion of the methods used to project recruiting results see Congressional Budget Office, "CBO's Method For Projecting the Recruitment and Retention of Enlisted Military Personnel," unpublished paper (November 1982). The elasticities shown in Table A-4 have been adjusted slightly to reflect changes in recruiting experience over the past two years.